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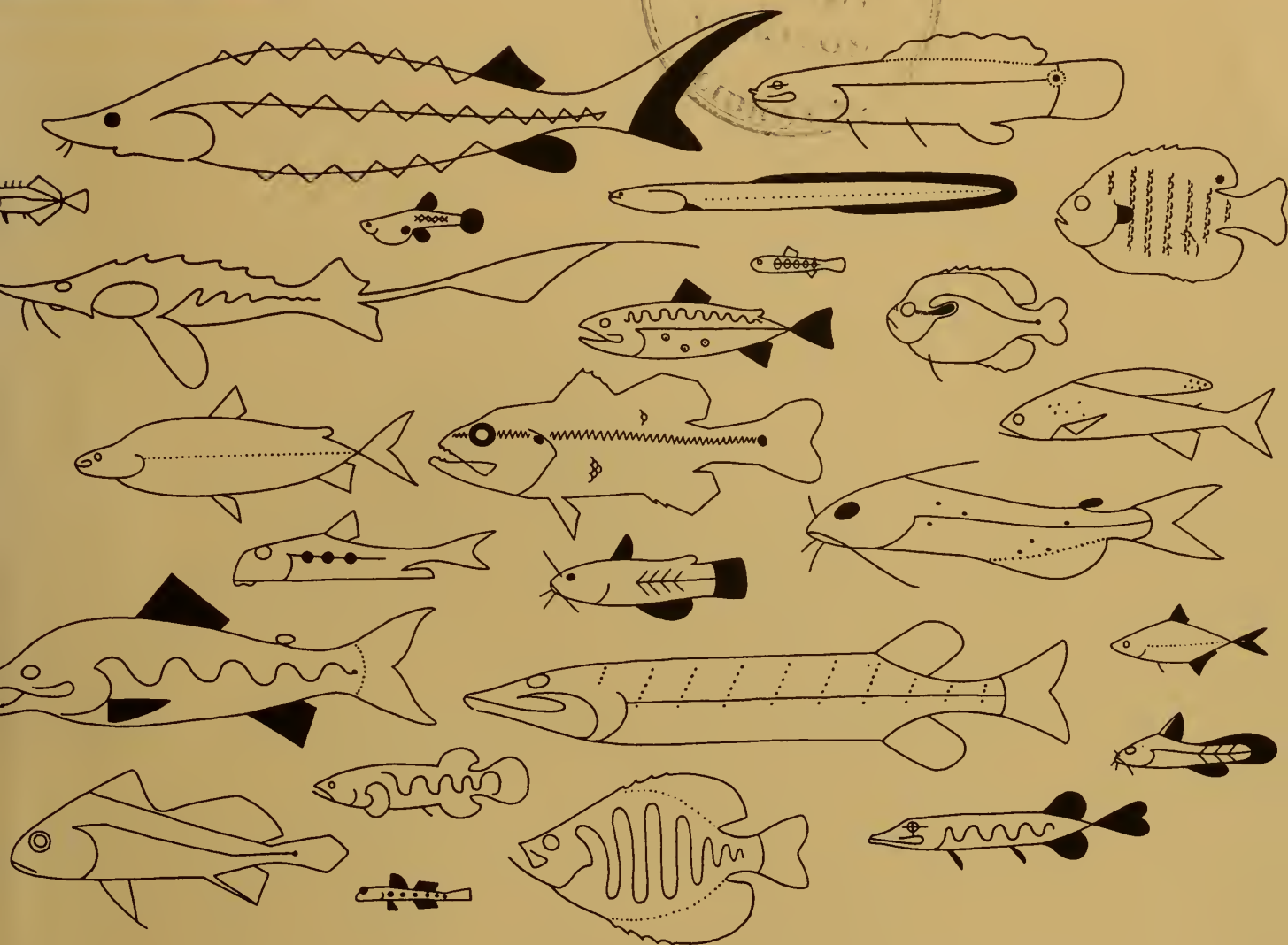
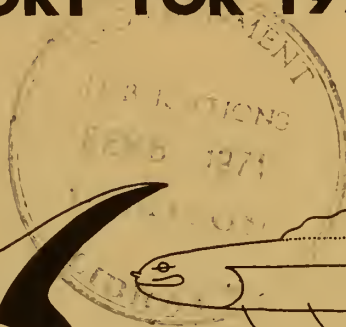
DIVISION OF FISHERY SERVICES

ANNUAL REPORT FOR 1970

Clemson University



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UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

RESOURCE PUBLICATION 101



As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of this department of natural resources.

The Department works to assure the wisest choice in managing all our resources so that each shall make its full contribution to a better United States now and in the future.

Cover -- Drawing by Craig Phillips, National Fisheries Center and Aquarium, Washington, D.C.

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

**DIVISION OF FISHERY SERVICES
ANNUAL REPORT
1970**

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Bureau of Sport Fisheries and Wildlife
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LOCATIONS OF REGIONAL OFFICES, DIVISION FIELD STATIONS AND COOPERATIVE FISHERY UNITS

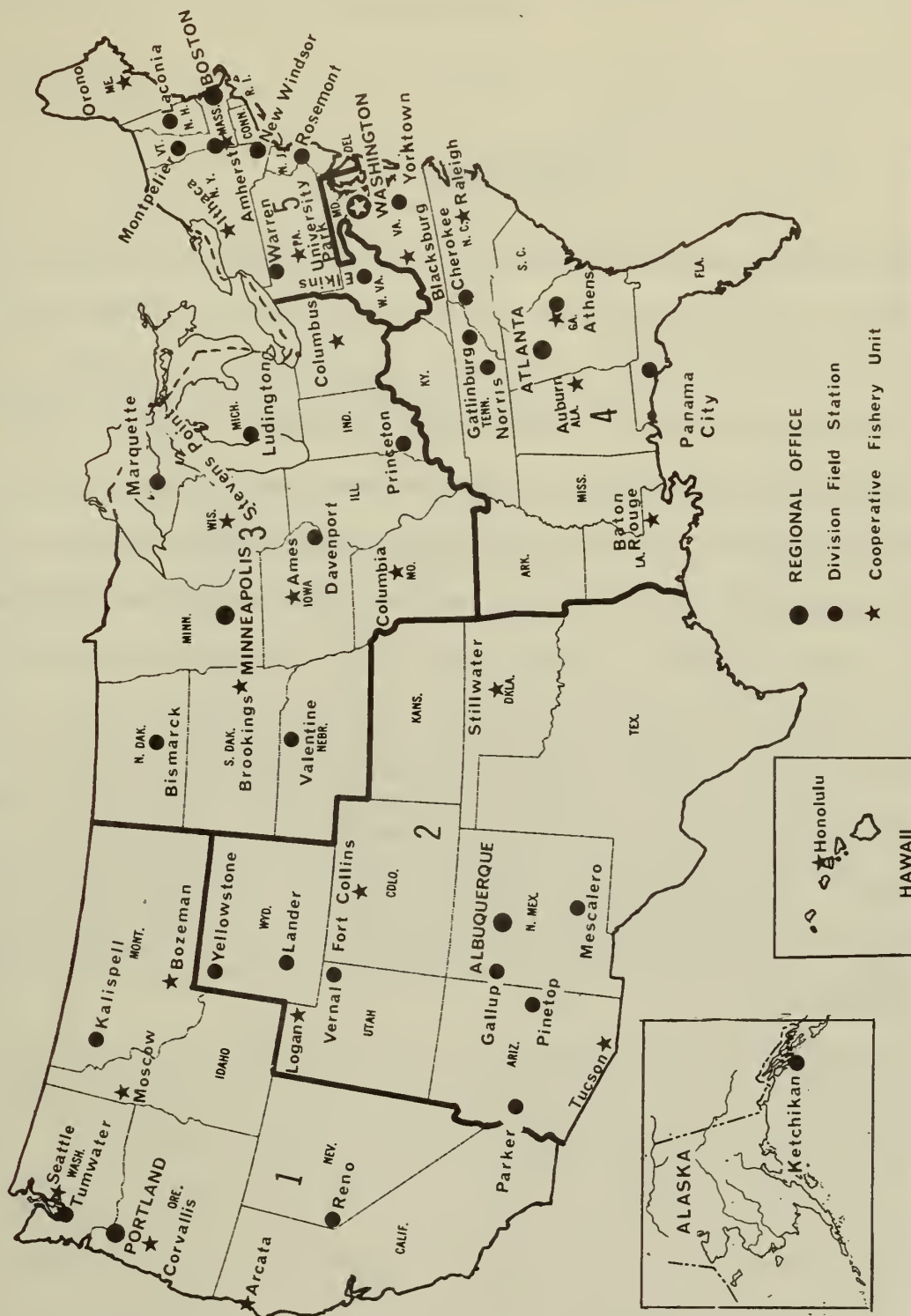


Figure 1. --Locations of Regional Offices, Division Field Stations, and Cooperative Fishery Units.

Introduction

Fishery Services was established in 1957 with a staff of 16 fishery biologists. It was known first as the Branch of Fishery Management Services; then the Division of Fishery Management Services (1963); and finally the Division of Fishery Services (1965). Prior to 1957 some phases of the program were conducted under the Section of Fisheries Management, Branch of Game-fish and Hatcheries. The Division has grown during the years and has added new responsibilities such as fish-pesticide field appraisals (1964) and monitoring (1967) and the Cooperative Fishery Unit program (1962). In October 1970, the Great Lakes Sea Lamprey Control Program was transferred to the Bureau from the Bureau of Commercial Fisheries and assigned to the Division. Today, when at full complement, there are 176 highly qualified professionals in the Division, plus supporting clerical and administrative personnel.

While central coordination is maintained from the Washington office, all field activities are supervised from the regional offices.

OBJECTIVES AND PROGRAMS

A primary objective of the Division of Fishery Services is to provide sport fishing for the present and future by improving the existing sport fishery and developing new fisheries through the application of modern fishery management techniques learned from research and experience.

The Division carries out this objective as follows:

1. By providing guidance to Federal landowner agencies in the development and execution of fishery management programs so as to make the maximum fishing available without undue interference with the primary objectives of the areas.

In 1970, Division of Fishery Services biologists provided fishery management assistance to 267 Federal areas. These lands encompass 11,825 miles of streams and 445 thousand acres of lakes and impoundments under management. During the year, 6.0 million man-days of fishing occurred on these areas, which was a slight increase over 1969.

2. By providing technical assistance for fishery management programs on Indian reservations.

Fishery Services biologists assisted 66 Indian tribes in 1970 with their fishery programs. Some 1.7 million man-days of sport fishing were enjoyed by Indians and the general public. This was a 7.5 percent increase in angling trips over 1969.

3. By assuring that the fish produced at national fish hatcheries are stocked in such a manner as to provide maximum fishing to the anglers; and to provide the necessary information which will help gear hatchery production to stocking requirements.

In 1970, the Division of Fish Hatcheries provided nearly 31 million fish (2.9 million pounds) for waters that are under management programs assisted by Fishery Services personnel. Technical assistance was provided to 585 individual areas. Our biologists reported 9.5 million angling trips for these waters, an increase of 0.8 million over 1969.

4. By cooperating with, and providing assistance to, the 50 States in their fishery management programs where there are mutual State-Federal interests. Duplication of effort is avoided and accomplishments are greater when both agencies work together.

The Division of Fishery Services maintains close coordination with the States on subjects of mutual interest. Regularly scheduled meetings are held with the State fish and game departments regarding cooperative fish stocking programs. Other cooperative projects include fishery surveys, creel censuses, limnological studies, fish control operations, pesticide monitoring and field appraisal, reservoir studies, fisheries of interstate rivers, and pollution investigations. The success of many sport fishery programs is a direct result of the close teamwork between State and Division fishery biologists.

A second objective is the training of fishery scientists through the Cooperative Fishery Units. This is done by participation in programs of training and studies at 24 colleges and universities across the country. Graduates of the program find employment in Federal, State, and private agencies in management and in research.

The unit staff and students participate in management activities as a phase of training. An annual publication is prepared describing this program.

Since 1967 Division biologists have collected fish samples from watersheds throughout the country to determine pesticide concentrations. In 1970 three species of fish were collected from 100 different stations for this analysis. This activity is part of the National Pesticide Monitoring Program which is carried out under the auspices of the President's Council of Environmental Quality. Several of the Cooperative Fishery Units are involved in research related to pesticides in the aquatic environment. Field appraisal of pesticide applications to determine effect on aquatic habitat and fish is conducted and reported upon.

Division personnel carry out the field operations of the Great Lakes Sea Lamprey control program. These activities are divided into two functions--survey and evaluation, and control using chemicals.

Evaluation includes the operation and maintenance of a network of 16

electric assessment barriers on tributaries to Lake Superior to measure the change in abundance of spawning sea lampreys and to study their biology. Field crews check treated streams to determine the success of the operation. The Bureau acts as the agent of the Great Lakes Fishery Commission in this work.

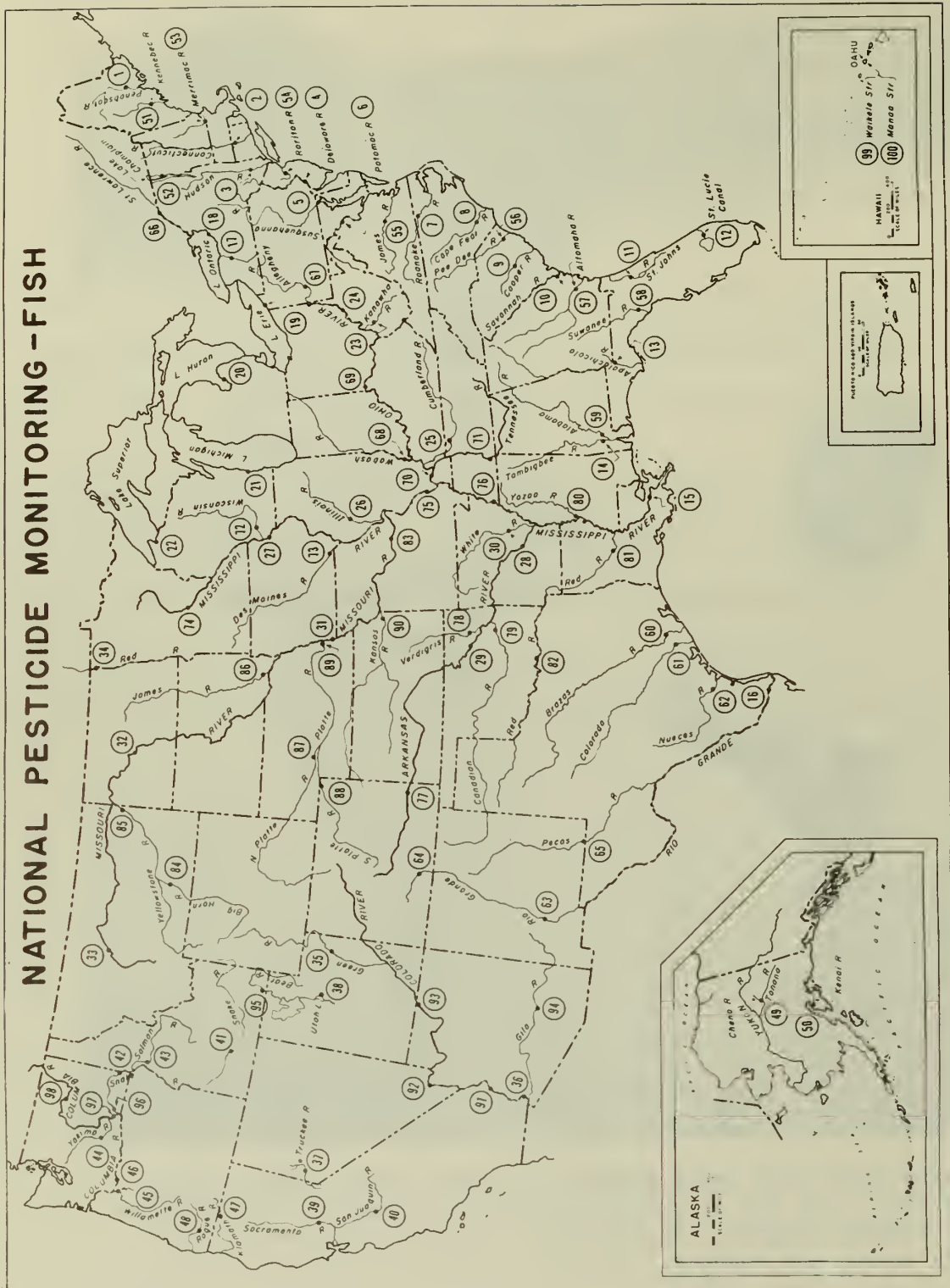
Division biologists provide information to the public on fishery management methods through extension-type activities and printed material. Several thousand such requests are answered each year.

Public services provided by the Division include participation in workshops; demonstrations of various management techniques; conservation exhibits; and numerous talks on fisheries to conservation organizations, civic groups, and youth groups. Biologists frequently appear on radio or television programs devoted to conservation.



The Division works with young people in several ways. Here a Bureau biologist baits hook for a youngster from the innercity of Atlanta in the Urban Fishing Program. In 1970 such programs were conducted in six cities across the country.

NATIONAL PESTICIDE MONITORING - FISH



This map indicates the site and river on which annual samples of fishes have been collected to determine pesticide concentrations by laboratory analyses. In 1970 fish were checked for DDE, TDE, DDT, Dieldrin, BHC, Heptachlor, Heptachlor Epoxide, Chlordane, PCB's, Lipids, Aldrin, Endrin, Lindane, Toxaphene, and Mercury.

Great Lakes Lamprey Control Program



This map shows the location of 16 lamprey barriers on Lake Superior which annually monitor the population density of the lamprey and the location of the streams that were treated in 1970 with TFM, the chemical used to control the lamprey.



Top Photo. Fishery biologist Terry Merkel checks water temperatures at a Jicarilla Indian Reservation trout lake.

Bottom Photo. Tribal members of the Tule River Indian Reservation assist biologist in stream survey operation.



Top Photo. The Secretary of Defense, the Conservation Manager, and the Commanding Officer all smile during presentation of the Secretary of Defense Conservation Award to Camp Pickett. Bottom Photo. The U.S. Air Force transported rainbow trout to the Azores and striped bass to Florida to help make Division programs a success.



Top Photo. Lewis River, Yellowstone National Park.

Bottom Photo. Moccasin Lake, Wind River Indian Reservation. Division biologists provide technical assistance at Yellowstone National Park and Wind River Indian Reservation where back country trout fishing is a big attraction.



Top Photo. Division biologists collect field data in many ways. Here they examine a trout population on an Indian reservation. Bottom Photo. Division biologists release young striped bass in Choctawhatchee Bay, Florida.



This eastern mountain trout stream is typical of waters on Federal lands where Division biologists provide technical assistance.

Table 1. -- Summary of Fishery Services on All Areas Served, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	62	80	182	179	82	585
Reports submitted	26	61	63	155	31	336
Waters under Management						
Acres of Lakes & Ponds	209,677	303,285	75,757	332,849	25,745	947,313
Miles of Streams	3,701	4,719	144	5,969	1,570	16,103
Acres of Fish Habitat Reclaimed or Improved	-	2,509	340	113	126	3,088
Miles of Stream Reclaimed or Improved	-	-	43	-	2	45
Acres of New Waters Developed	685	45	291	445	32	1,498
Pounds of Hatchery Fish	946,022	663,184	105,968	567,782	583,455	2,866,411
Number of Hatchery Fish	12,595,338	6,691,653	2,946,415	2,074,617	6,765,015	31,073,038
Man-days of Fishing	1,117,249	2,990,460	743,045	3,048,902	1,642,370	9,542,026

Table 2 . -- Summary of Fishery Services on Federal Areas Served, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	32	39	55	93	48	267
Reports submitted	8	29	39	75	20	171
Waters under Management Acres of Lakes & Ponds	53,335	116,775	58,275	199,159	17,357	444,901
Miles of Streams	1,304	2,989	89	5,889	1,554	11,825
Acres of Fish Habitat Reclaimed or Improved	-	1,260	29	113	125	1,527
Miles of Stream Reclaimed or Improved	-	-	-	-	2	2
Acres of New Waters Developed	25	25	83	445	32	610
Pounds of Hatchery Fish	92,267	55,419	23,429	425,215	337,806	934,136
Number of Hatchery Fish	1,089,684	349,575	2,006,560	1,339,317	3,229,731	8,014,867
Man-days of Fishing	515,298	1,125,544	591,300	2,760,626	1,045,700	6,038,468

Table 3 . -- Summary of Fishery Services on Federal Areas and Indian Reservations, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	55	67	66	96	49	333
Reports submitted	26	52	54	77	20	229
Waters under Management						
Acres of Lakes & Ponds	209,676	134,553	75,188	199,227	21,005	639,649
Miles of Streams	3,701	4,628	144	5,948	1,562	15,983
Acres of Fish Habitat Reclaimed or Improved	-	2,479	220	113	125	2,937
Miles of Stream Reclaimed or Improved	-	-	38	-	2	40
Acres of New Waters Developed	685	45	291	445	32	1,498
Pounds of Hatchery Fish	479,964	456,763	36,058	514,333	337,995	1,825,113
Number of Hatchery Fish	5,028,129	2,804,700	2,701,415	1,613,595	5,266,731	17,414,570
Man-days of Fishing	1,115,649	2,077,082	659,295	2,821,912	1,067,700	7,741,638

Table 4 . -- Summary of Fishery Services on Department of Defense Areas, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	21	18	16	60	30	145
Reports submitted	5	13	13	58	12	101
Waters under Management Acres of Lakes & Ponds	13,288	1,086	452	7,189	2,596	24,611
Miles of Streams	30	2	46	360	85	523
Acres of Fish Habitat Reclaimed or Improved	-	26	6	113	15	160
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	25	5	48	445	4	527
Pounds of Hatchery Fish	54,056	41,069	15,912	66,806	34,809	212,652
Number of Hatchery Fish	319,386	188,375	155,060	470,363	2,017,045	3,150,229
Man-days of Fishing	169,319	146,244	150,800	920,403	142,000	1,528,766

Table 5. -- Summary of Fishery Services on Air Force Bases, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	7	5	8	11	7	38
Reports submitted	4	5	8	10	3	30
Waters under Management Acres of Lakes & Ponds	337	230	263	1,300	666	2,796
Miles of Streams	18	-	3	-	14	35
Acres of Fish Habitat Reclaimed or Improved	-	5	6	10	-	21
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	5	-	20	-	25
Pounds of Hatchery Fish	16,759	18,411	7,063	859	2,424	45,316
Number of Hatchery Fish	73,006	78,685	64,810	18,000	9,250	243,751
Man-days of Fishing	44,874	32,481	116,550	257,600	26,600	478,105

Table 6. -- Summary of Fishery Services on Army Installations, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	7	13	8	30	14	72
Reports submitted	-	8	5	34	8	55
Waters under Management Acres of Lakes & Ponds	594	856	189	3,833	1,872	7,344
Miles of Streams	12	2	43	316	69	442
Acres of Fish Habitat Reclaimed or Improved	-	21	-	90	15	126
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	25	-	48	425	4	502
Pounds of Hatchery Fish	30,063	22,658	8,849	60,144	30,714	152,428
Number of Hatchery Fish	171,780	109,690	90,250	406,908	1,998,795	2,777,423
Man-days of Fishing	66,729	113,763	34,250	555,458	104,800	875,000

Table 7 . -- Summary of Fishery Services on Navy and Marine Bases, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	7	-	-	19	9	35
Reports submitted	1	-	-	14	1	16
Waters under Management Acres of Lakes & Ponds	12,357	-	-	2,056	58	14,471
Miles of Streams	-	-	-	44	2	46
Acres of Fish Habitat Reclaimed or Improved	-	-	-	13	-	13
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	7,234	-	-	5,803	1,671	14,708
Number of Hatchery Fish	74,600	-	-	45,455	9,000	129,055
Man-days of Fishing	57,716	-	-	107,345	10,600	175,661

Table 8. -- Summary of Fishery Services on National Forests, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	-	-	3	6	6	15
Reports submitted	-	-	5	-	6	11
Waters under Management						
Acres of Lakes & Ponds	-	-	314	9,694	12,676	22,684
Miles of Streams	-	-	16	4,517	1,440	5,973
Acres of Fish Habitat Reclaimed or Improved	-	-	23	-	95	118
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	12	-	28	40
Pounds of Hatchery Fish	-	-	2,998	335,417	294,353	632,768
Number of Hatchery Fish	-	-	28,870	720,285	1,184,136	1,933,291
Man-days of Fishing	-	-	11,500	1,044,955	892,600	1,949,055

Table 9 . -- Summary of Fishery Services on National Parks, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	3	2	1	5	-	11
Reports submitted	1	2	1	3	-	7
Waters under Management						
Acres of Lakes & Ponds	34,612	104,115	-	187	-	138,914
Miles of Streams	1,264	2,936	5	961	-	5,166
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	30,075	-	139	21,384	-	51,598
Number of Hatchery Fish	710,307	-	500	105,619	-	816,426
Man-days of Fishing	299,679	399,000	300	268,113	-	967,092

Table 10. -- Summary of Fishery Services on National Wildlife Refuges, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	7	11	18	15	5	56
Reports submitted	1	10	10	9	1	31
Waters under Management Acres of Lakes & Ponds	5,335	11,384	57,048	182,057	1,986	257,810
Miles of Streams	10	51	22	51	29	163
Acres of Fish Habitat Reclaimed or Improved	-	1,226	-	-	-	1,226
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	20	23	-	-	43
Pounds of Hatchery Fish	7,836	8,727	13	1,155	915	18,646
Number of Hatchery Fish	59,991	135,177	1,805,000	36,050	2,800	2,039,018
Man-days of Fishing	45,300	563,812	399,700	507,728	11,700	1,528,240

Table 11. -- Summary of Fishery Services on Veterans Administration Areas, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	-	3	8	3	6	20
Reports submitted	-	1	7	1	1	10
Waters under Management						
Acres of Lakes & Ponds	-	115	78	12	69	274
Miles of Streams	-	-	-	-	-	-
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	-	1,929	4,307	453	2,033	8,722
Number of Hatchery Fish	-	3,003	8,070	7,000	8,250	26,323
Man-days of Fishing	-	9,000	18,100	12,955	5,800	45,855

Table 12. -- Summary of Fishery Services on Miscellaneous Federal Areas, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	1	5	9	4	1	20
Reports submitted	1	3	3	4	-	11
Waters under Management Acres of Lakes & Ponds	100	75	383	20	30	608
Miles of Streams	-	-	-	-	-	-
Acres of Fish Habitat Reclaimed or Improved	-	8	-	-	15	23
Miles of Stream Reclaimed or Improved	-	-	-	-	2	2
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	-	3,694	50	-	5,699	9,443
Number of Hatchery Fish	-	23,020	9,060	-	17,500	49,580
Man-days of Fishing	1,000	7,488	10,900	6,472	2,500	28,360

Table 13. -- Summary of Fishery Services on Indian Reservations, 1970

	R E G I O N					Total
	1	2	3	4	5	
Areas served	23	28	11	3	1	66
Reports submitted	18	23	15	2	-	58
Waters under Management Acres of Lakes & Ponds	156,341	17,778	16,913	68	3,648	194,748
Miles of Streams	2,397	1,639	55	59	8	4,158
Acres of Fish Habitat Reclaimed or Improved	-	1,219	191	-	-	1,410
Miles of Stream Reclaimed or Improved	-	-	38	-	-	38
Acres of New Waters Developed	660	20	208	-	-	888
Pounds of Hatchery Fish	387,697	401,344	12,629	89,118	189	890,977
Number of Hatchery Fish	3,938,445	2,455,125	694,855	274,278	2,037,000	9,399,703
Man-days of Fishing	600,351	951,538	67,995	61,286	22,000	1,703,170

Table 14. -- Summary of Fishery Services on State-Federal Cooperative Areas, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	*6	7	1	5	4	23
Reports submitted	-	5	1	2	7	15
Waters under Management Acres of Lakes & Ponds	-	168,700	35	49,710	4,377	222,822
Miles of Streams	-	91	-	21	8	120
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	465,915	201,823	68,300	47,580	242,264	1,025,882
Number of Hatchery Fish	7,565,709	3,868,275	161,000	195,534	1,334,109	13,124,627
Man-days of Fishing	*	898,500	75,750	223,110	504,600	1,701,960

*Federal-State Cooperative management programs in Montana, California, Washington, Oregon, Idaho, and Nevada. Man-days of fishing unknown.

Table 15. -- Summary of Fishery Services on Other Public Waters, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	-	-	*6	1	2	9
Reports submitted	-	-	6	1	-	7
Waters under Management						
Acres of Lakes & Ponds	-	-	-	83,840	72	83,912
Miles of Streams	-	-	-	-	-	-
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	5	-	-	5
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	-	-	-	5,801	2,000	7,801
Number of Hatchery Fish	-	-	-	258,318	6,000	264,318
Man-days of Fishing	-	-	-	1,220	5,170	6,390

*Fish-kill and oil spill investigation.

Table 16. -- Summary of Fishery Services on Private Waters, 1970

	R E G I O N					
	1	2	3	4	5	Total
Areas served	1	6	109	77	27	220
Reports submitted	-	4	2	75	4	85
Waters under Management Acres of Lakes & Ponds	1	32	534	72	291	930
Miles of Streams	-	-	-	-	-	-
Acres of Fish Habitat Reclaimed or Improved	-	30	120	-	1	151
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Pounds of Hatchery Fish	443	4,598	1,620	68	1,193	7,922
Number of Hatchery Fish	1,500	18,678	84,000	7,170	158,175	269,523
Man-days of Fishing	1,600	14,878	8,000	2,660	56,000	83,138



Young fisherman displays his first Atlantic salmon. This fish, considered by many anglers as the ultimate challenge in sport fishing, is being reintroduced in many rivers in the Northeast.

